

# A rare distribution of erythema elevatum diutinum and improvement of refractory erythema elevatum diutinum with the treatment of IVIg

shuangfei Liu<sup>1</sup>, Sai Yang<sup>2</sup>, Huaiyi Xu<sup>2</sup>, Guomin Li<sup>2</sup>, and Bin Yang<sup>2</sup>

<sup>1</sup>Dermatology Hospital of Southern Medical University

<sup>2</sup>Guangdong Provincial Dermatology Hospital

September 19, 2022

## Abstract

We present a case of erythema elevatum diutinum. A biopsy of the skin lesion showed a significant increase of neutrophils, fragmented nuclei, and fibrinoid necrosis of vascular tissue in the middle and deep layers of the dermis. The patient's condition was stabilized after treatment of IVIg.

## Introduction

Erythema elevatum diutinum (EED) is a kind of leukocytoclastic vasculitis, first reported by Hutchinson in 1888(1). Its typical skin lesions usually show symmetrical brownish-red papules, plaques, or lumps higher than the skin surface, which are mainly located on the extended side of the limb joints(2). It is reported that EED is associated with streptococcal infections, IgA paraproteinemia, and some malignant diseases(3).

## Case presentation

A 31-year-old woman presented with a 1-year history of purplish-red papules, nodules, and blisters symmetrically distributed on her scalp, trunk, and limbs (Fig. 1). The patient had a previous history of pulmonary tuberculosis. Laboratory test results of the patient show elevated serum levels of IgG (356.2 mg/dL; normal range, 60–160mg/dL) and IgA (37.6 mg/dL; normal range, 7–36 mg/dL). Reduced level of C3 (75 mg/dL; normal range, 79–152 mg/dL) and C4 (12 mg/dL; normal range, 16–38 mg/dL) were observed. A monoclonal band was observed as IgA- $\lambda$  paraprotein on serum electrophoresis. The serum complement profile showed reduction of C3 (64.8 mg/dL; normal range, 79–152 mg/dL) and C4 (11.9 mg/dL; normal range, 16–38 mg/dL). Examinations for hepatitis B and HIV were negative. Full blood count, renal and liver function tests, and autoimmune antibodies such as antinuclear antibodies were all within the normal range. A biopsy from the left foot specimen presented a significant increase of neutrophils, fragmented nuclei, and fibrinoid necrosis of vascular tissue in the middle and deep layers of the dermis (Fig. 2).

According to the clinical manifestation and auxiliary examination results, the diagnosis of erythema elevatum diutinum was considered. Initial therapy included methylprednisolone and dapsone, beginning at 40mg/d and 100mg/d, respectively. Colchicine 1g/d and dapsone 200mg/d were subsequently added to her treatment regimen because this patient had a poor response to dapsone and corticosteroid and her condition continued to deteriorate. Subsequently, after continuous IVIg (intravenous immunoglobulin) 22.5g/d for 5 days, the patient's condition was quickly stabilized. After a one-month follow-up, most of the plaques subsided and the papules flattened.

## Discussion

To our knowledge, we report the first case of EED with skin lesions involving the scalp, and the first case of EED improved with the treatment of IVIg. According to the current reports, EED skin lesions mostly occur in the limbs, especially in the joints<sup>(4)</sup>. Recently, it has been reported that EED lesions can occur in some atypical sites such as the trunk and palm, and these EED cases have been reported to be related to non-Hodgkin lymphomas and IgA gammopathy<sup>(5, 6)</sup>. These cases have a good response to the therapy. However, our case is more peculiar. This case shows a history of pulmonary tuberculosis and abnormal levels of IgG and IgA. In addition, lesions of this patient were distributed not only on the trunk and plantar surface but also on the scalp. Furthermore, this case showed an ineffective response to dapsone and corticosteroids. Therefore, we speculate that EED with multiple underlying diseases as well as the lesions involving the atypical sites has a poor response to traditional treatments such as dapsone and corticosteroids.

In addition, this patient showed a sensitive response to IVIg with no obvious side effects. IVIg is thought to interrupt the steps of the complement activation cascade and down-regulate B cell proliferation<sup>(7)</sup>. It has been proved to have a good curative effect in patients with pemphigus, dermatomyositis, and scleroderma. In the literature we retrieved so far, this is the first case of IVIg in the treatment of EED. A large number of literature have reported that dapsone has been successfully used in the treatment of EED, but still showed poor efficacy in about 20% of patients<sup>(8)</sup>. Treatment for refractory EED should also be considered. For those patients with a poor response to dapsone and corticosteroids or intolerant to dapsone, this case provides another option for the treatment of EED. However, because this is the first case of EED treated with IVIg, its efficacy should be confirmed by more patients with longer follow-up.

#### Author lists:

Shuangfei Liu: Conceptualization and writing the original draft.

Sai Yang: Diagnosing, care, and treatment of the patient.

Huaiyi Xu: Conceptualization and writing the original draft.

Guomin Li: Conceptualization and writing the original draft.

Bin Yang: Diagnosing, care, and treatment of the patient.

#### Reference

1. Hutchinson J. On two remarkable cases of symmetrical purple congestion of the skin in patches, with induration. *Br J Dermatol.* 1888;1:10-5.
2. Sandhu JK, Albrecht J, Agnihotri G, Tsoukas MM. Erythema elevatum et diutinum as a systemic disease. *Clin Dermatol.* 2019;37(6):679-83.
3. <iga eed.pdf>.
4. Doktor V, Hadi A, Hadi A, Phelps R, Goodheart H. Erythema elevatum diutinum: a case report and review of literature. *Int J Dermatol.* 2019;58(4):408-15.
5. Hatzitolios A, Tzellos TG, Savopoulos C, Tzalokostas V, Kaiafa G, Psomas E, et al. Erythema elevatum diutinum with rare distribution as a first clinical sign of non-Hodgkin's lymphoma: a novel association? *J Dermatol.* 2008;35(5):297-300.
6. Barzegar M, Davatchi C, Akhyani M, Nikoo A, Daneshpazhooh M, Farsinejad K. An atypical presentation of erythema elevatum diutinum involving palms and soles. *International journal of dermatology.* 2009;48(1):73-5.
7. Hartung HP. Advances in the understanding of the mechanism of action of IVIg. *J Neurol.* 2008;255 Suppl 3:3-6.
8. Momen SE, Jorizzo J, Al-Niaimi F. Erythema elevatum diutinum: a review of presentation and treatment. *J Eur Acad Dermatol Venereol.* 2014;28(12):1594-602.

Figure 1

Figure legend: (a) Purplish-red papules and nodules distributed on the scalp; (b) Purplish-red papules and nodules distributed on the trunk and elbows, (c) Purplish-red papules and erosion distributed on the planta; (d) Purplish-red papules, nodules, and blisters symmetrically distributed on the shins

Figure 2

Figure legend: A marked increase of neutrophils, fragmented nuclei, and fibrinoid necrosis of vascular in the middle and deep layers of the dermis (hematoxylin-eosin, original magnification  $\times 200$ )



